

WHAT IS CLAIMED IS:

1. A roll, comprising:  
a core, and  
a coating comprising a glass material formed over the core, wherein the  
glass material can be electrically charged and discharged.

2. ~~The roll of claim 1, wherein the glass material is a silicate glass.~~

3. The roll of claim 2, wherein the glass material comprises:  
silica, from about 40 mol% to about 95 mol%;  
soda, from about 5 mol% to about 60 mol%;  
alumina, from 0 to about 7 mol%;  
phosphate, from 0 to about 5 mol%;  
potash, from 0 to about 10 mol%;  
titania, from 0 to about 20 mol%;  
vanadium penta-oxide, from 0 to about 10 mol%;  
chromia, from 0 to about 8 mol%;  
iron oxide, from 0 to about 5 mol%;  
nickel, from 0 to about 5 mol%;  
silver, from 0 to about 5 mol%; and  
gold, from 0 to about 5 mol%.

4. The roll of claim 3, wherein the glass material comprises:  
silica, about 40 wt%;  
soda, about 20 wt%;  
alumina, about 1.5 wt%;  
phosphate, about 4 wt%;  
potash, about 7 wt%;  
titania, about 12 wt%;  
vanadium penta-oxide, about 6 wt%;  
chromia, about 4 wt%;  
iron oxide, about 3.5 wt%; and  
NiO (Nickel Oxide), about 2 wt%.

5. ~~The roll of claim 1, wherein the coating consists essentially of a silicate glass.~~

Sub  
AI

Sub  
AI

001650 62613500

6. The roll of claim 1, wherein the coating has an arithmetical mean roughness  $R_a$  of less than about  $1\text{ }\mu\text{m}$  and a maximum waviness of less than about  $1\text{ }\mu\text{m}$ .

7. The roll of claim 1, wherein the coating has an electrical resistivity of from about  $1 \times 10^5\text{ }\Omega\cdot\text{cm}$  to about  $1 \times 10^{14}\text{ }\Omega\cdot\text{cm}$ .

8. The roll of claim 1, wherein the coating has a hardness of at least about 4 GPa Knoop

9. The roll of claim 1, wherein the core has a first coefficient of thermal expansion and the coating has a second coefficient of thermal expansion that differs from the first coefficient of thermal expansion by less than about  $1\text{ ppm}/^\circ\text{C}$ .

10. The roll of claim 1, wherein the glass material is chemically resistant to toner and paper fibers.

11. The roll of claim 1, wherein the core comprises a metal.

12. The roll of claim 1, wherein the core comprises a non-metallic material having a metal coating on which the coating is formed.

13. An electrostatographic imaging apparatus comprising a roll according to claim 1.

14. A charge donor roll, comprising:  
a core; and  
a coating comprising a glass material formed over the core, wherein the coating can be electrically charged and discharged.

15. The charge donor roll of claim 14, wherein the glass material is a silicate glass.

16. The charge donor roll of claim 15, wherein the glass material comprises:

silica, from about 40 mol% to about 95 mol%;  
soda, from about 5 mol% to about 60 mol%;  
alumina, from 0 to about 7 mol%;  
phosphate, from 0 to about 5 mol%;  
potash, from 0 to about 10 mol%;  
titania, from 0 to about 20 mol%;  
vanadium penta-oxide, from 0 to about 10 mol%;  
chromia, from 0 to about 8 mol%;

iron oxide, from 0 to about 5 mol%;  
 nickel, from 0 to about 5 mol%;  
 silver, from 0 to about 5 mol%; and  
 gold, from 0 to about 5 mol%.

17. The charge donor roll of claim 16, wherein the glass material comprises:

silica, about 40 wt%;  
 soda, about 20 wt%;  
 alumina, about 1.5 wt%;  
 phosphate, about 4 wt%;  
 potash, about 7 wt%;  
 titania, about 12 wt%;  
 vanadium penta-oxide, about 6 wt%;  
 chromia, about 4 wt%;  
 iron oxide, about 3.5 wt%; and  
 Ni, about 2 wt%.

18. The charge donor roll of claim 14, wherein the coating consists essentially of a silicate glass.

19. The charge donor roll of claim 14, wherein the coating has an arithmetical mean roughness  $R_a$  of less than about 1  $\mu\text{m}$  and a maximum waviness of less than about 1  $\mu\text{m}$ .

20. The charge donor roll of claim 14, wherein the coating has an electrical resistivity of from about  $1 \times 10^5 \Omega\text{-cm}$  to about  $1 \times 10^{14} \Omega\text{-cm}$ .

21. The charge donor roll of claim 14, wherein the coating has a hardness of at least about 4 GPa Knoop.

22. The charge donor roll of claim 14, wherein the core has a first coefficient of thermal expansion and the outer coating has a second coefficient of thermal expansion that differs from the first coefficient of thermal expansion by less than about 1 ppm/ $^{\circ}\text{C}$ .

23. The charge donor roll of claim 14, wherein the glass material is chemically resistant to toner and paper fibers.

24. The charge donor roll of claim 14, wherein the core comprises a metal.

10

15

20

25

30

Sub  
 CI  
 cont

0050137-0500  
 0050137-0500

Sub  
 CI

Sub  
 CI

Sub  
 CI

Sub C1  
25. The charge donor roll of claim 14, wherein the core comprises a non-metallic material having a metal coating on which the coating is formed.

26. An electrostaticographic imaging apparatus comprising a charge donor roll according to claim 14.

Sub A2  
5 27. A method of making a roll, comprising forming a coating over a core, the coating comprising a glass material that can be electrically charged and discharged.

28. The method of claim 27, wherein the coating consists essentially of a glass material.

10 29. The method of claim 27, wherein the glass material is a silicate glass.

Sub C1  
30. The method of claim 29, wherein the glass material comprises:

silica, from about 40 mol% to about 95 mol%;

soda, from about 5 mol% to about 60 mol%;

alumina, from 0 to about 7 mol%;

15 phosphate, from 0 to about 5 mol%;

potash, from 0 to about 10 mol%;

titania, from 0 to about 20 mol%;

vanadium penta-oxide, from 0 to about 10 mol%;

chromia, from 0 to about 8 mol%;

20 iron oxide, from 0 to about 5 mol%;

nickel, from 0 to about 5 mol%;

silver, from 0 to about 5 mol%; and

gold, from 0 to about 5 mol%.

31. The method of claim 30, wherein the glass material comprises:

25 silica, about 40 wt%;

soda, about 20 wt%;

alumina, about 1.5 wt%;

phosphate, about 4 wt%;

potash, about 7 wt%;

30 titania, about 12 wt%;

vanadium penta-oxide, about 6 wt%;

chromia, about 4 wt%;

iron oxide, about 3.5 wt%; and

~~Ni, about 2 wt%.~~

~~32. The method of claim 27, wherein the coating consists essentially of a silicate glass.~~

~~33. The method of claim 27, wherein the coating has an arithmetical mean roughness Ra of less than about 1  $\mu\text{m}$  and a maximum waviness of less than about 1  $\mu\text{m}$ .~~

~~34. The method of claim 27, wherein the coating has an electrical resistivity of from about  $1 \times 10^5 \Omega\text{-cm}$  to about  $1 \times 10^{14} \Omega\text{-cm}$ .~~

~~35. The method of claim 27, wherein the coating has a hardness of at least about 4 GPa Knoop.~~

~~36. The method of claim 27, wherein the core has a first coefficient of thermal expansion and the coating has a second coefficient of thermal expansion that differs from the first coefficient of thermal expansion by less than about 1 ppm/ $^{\circ}\text{C}$ .~~

~~37. The method of claim 27, wherein the glass material is chemically resistant to toner and paper fibers.~~

~~38. The method of claim 27, wherein the coating is applied on the core by electrostatic spraying.~~

~~39. The method of claim 27, wherein the coating is applied on the core by wet spraying.~~

~~40. The method of claim 27, wherein the core comprises an electrically conductive material on which the outer coating is applied.~~

~~41. The method of claim 27, wherein the core comprises a metal outer surface on which the coating is formed.~~

Sub  
C1  
cont

Sub  
C1  
5

Sub  
B3  
7

Sub  
C1  
10

001650-0248560  
006477-063100  
15  
Q 427

20

ADD  
B4